AFCTN Test Report 94-045

AFCTB-ID 93-085

Technical Engineering Drawing Transfer

Using:

Lockheed Missile & Space Company's Data

Supporting:

The Joint Advance Rocket System

Contract #N00019-9-2-C-185

MIL-D-28000A (IGES)

Quick Short Test Report

02 September 1993

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Prepared for
Electronic Systems Center
Det 2 HQ ESC/AV-2
4027 Colonel Glenn Hwy, Suite 300
Dayton, Ohio 45431-1672

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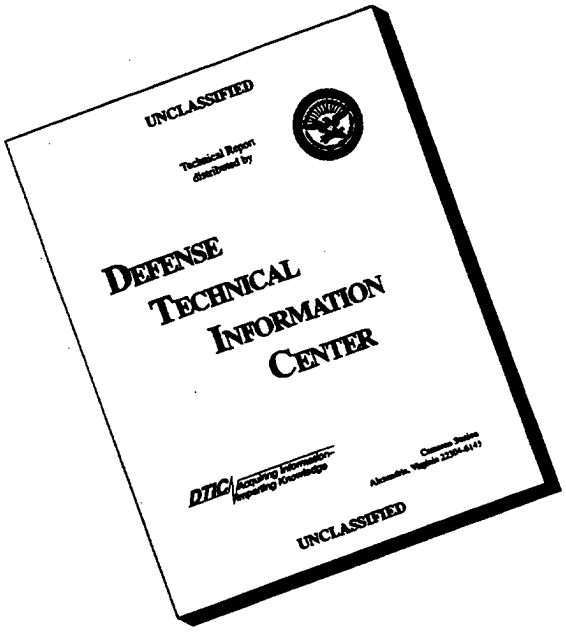

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Quick Short Test Report

02 September 1993

Prepared By
Air Force CALS Test Bed
Wright-Patterson AFB, OH 45433

AFCTB Contact
Gary Lammers
(513) 427-2295

AFCTN Contact
Mel Lammers
(513) 427-2295

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1. Introduction

1.1 Background

The Department of Defense (DoD) Air Force Continuous Acquisition and Life-Cycle Support (CALS) Test Network (AFCTN) is conducting tests of the military standard for the Automated Interchange of Technical Information, MIL-STD-1840A, and its companion suite of military specifications. The AFCTN is a DoD sponsored confederation of voluntary participants from industry and government managed by the Electronic Systems Center (ESC).

The primary objective of the AFCTN is to evaluate the effectiveness of the CALS standards for technical data interchange and to demonstrate the technical capabilities and operational suitability of those standards. Two general categories of tests are performed to evaluate the standards; formal and informal.

Formal tests are large and comprehensive, which follow a written test plan, require specific authorization from the DoD, and may take months to prepare, execute, and report.

Informal tests are quick and short, used by the AFCTN technical staff, to broaden the testing base. They include representative samples of the many systems and applications used by AFCTN participants. They also allow the AFCTN staff to gain feedback from many industry and government interpretations of the standards, to increase the base of participation in the CALS initiative, and respond to the many requests for help that come from participants. Participants take part voluntarily, benefit by receiving an evaluation of their latest implementation (interpretation) of the standards, interact with the AFCTN technical staff, gain experience using the standards, and develop increased confidence in them. The results of informal tests are reported in Quick Short Test Reports (QSTRs) that briefly summarize the standard(s) tested, the hardware and software used, the nature of the test, and the results.

1.2 Purpose

The purpose of the informal test, reported in this QSTR, was to analyze Lockheed Missile & Spaces Company's interpretation and use of the CALS standards in transferring technical engineering data. Lockheed used its Sun Sparc server 670 MP with Cadkey's v5.2 software to produce data, in accordance with the standards, and delivered it to the AFCTN technical staff on a 9-track magnetic tape.

2. Test Parameters

Test Plan: AFCTB 93-085

Date of Evaluation: 02 September 1993

Evaluator:
George Elwood
Air Force CALS Test Bed
Det 2 HQ ESC/AV-2P
4027 Colonel Glenn Hwy
Suite 300
Dayton OH 45431-1672

Data Originator:
Tom Benjamin
Lockheed Missile & Space Company
T4-02, 312, 3
6800 Burleson Road
P.O. Box 17100
Austin TX 78760-7100
(512) 386-2887

Data Description:
Technical Manual Test
2 Document Declaration files
2 Initial Graphics Exchange Specification (IGES) files

Data Source System:

1840

HARDWARE
Unknown

SOFTWARE
AFCTN *Tapetool v1.2.10 UNIX*

IGES

HARDWARE
SUN Sparc Server 670 MP

SOFTWARE
Cadkey/UX v5.2

Evaluation Tools Used:

MIL-STD-1840A (TAPE)

SUN 3/280

AFCTN *Tapetool v1.2.10 UNIX*
XSoft *CAPS/CALS v40.4*

MIL-D-28000 (IGES)

Sun SparcStation 2

ArborText *iges2draw*
Carberry *CADLeaf Plus v3.1*
IGES Data Analysis (IDA) *Parser/Verifier v92*
IDA *IGESView v3.05*
IDA *IGESXpert v1.0*
Intergraph *I/EMS 02.00.01.11*
Intergraph *I/CIGES 02.00.01.03*
International TechneGroup Incorporated (ITI) *IGES/Works v1.3*
Rosetta Technologies *Prepare*
Rosetta Technologies *Preview v3.2*

PC 486/50

AUTODESK *AutoCAD 386 R12*
Cadkey *Cadkey v5.02*
IDA *IGESView Windows*
Rosetta Technologies *Prepare*
Rosetta Technologies *Preview*

Standards Tested:

MIL-STD-1840A
MIL-D-28000A

3. 1840A Analysis

3.1 External Packaging

The tape arrived at the Air Force CALS Test Bed (AFCTB) enclosed in a box in accordance with ASTM D 3951. The exterior of the box was marked with a magnetic tape warning label, as required by MIL-STD-1840A, para. 5.3.1.3.

The tape was enclosed in a barrier bag as required by MIL-STD-1840A, para. 5.3.1.2. Tape reel did not have a label indicating the recording density, as required by MIL-STD-1840A, para. 5.3.1. Some 9-track tape units require this BPI to be set manually. Enclosed in the box was a packing list showing all files recorded on the tape.

3.2 Transmission Envelope

The 9-track tape received by the AFCTB contained MIL-STD-1840A files. The files were named per the standard conventions.

3.2.1 Tape Formats

The tape was run through the AFCTN *Tapetool v1.2.10* utility. No errors were encountered while evaluating the contents of the tape labels.

The tape was read using the XSoft *CAPS read1840A* utility without any reported errors.

The physical structure of the tape meets the CALS MIL-STD-1840A requirements.

3.2.2 Declaration and Header Fields

No errors were found in the Document Declaration files and data file headers. This portion of the tape meets the MIL-STD-1840A requirements.

4. IGES Analysis

The tape contained two IGES files. These files were evaluated using IDA's *parser/verifier* set for CALS Class II. Both files were reported in error due to the use of IGES version 5.1. The use of this version is not permitted in the CALS MIL-D-28000A specification, except for Class V files. Also reported as an error was a missing drawing entity.

The Start section statement required by the MIL-D-28000A, para. 3.2.2.4.1 was not found.

The AFCTB has several tools for viewing IGES files. These tools are not used to generate a pass/fail but to report how commercially available software can handle the files. Many of these products are used in the development of technical publications and are good indicators of usability. The use of these products is not an endorsement nor an indication of CALS capability. All operations were performed using the default settings.

The files were converted using ArborText's *iges2draw* utility with no reported errors. The resulting files were read into Island Graphics' *IslandDraw*, displayed and printed without a reported error.

The files were read using AUTODESK's *AutoCAD R12* with translator version 5.1. Some errors and warnings were generated during the conversion processes relating to font selections. The files were displayed and printed without a reported error. However, it was noted that the diameter symbol was displayed incorrectly on the screen and hard copy. It was displayed as a "n" instead of "Ø".

The files were converted using Cadkey's *ig2c* utility. The resulting files were read into Cadkey's *Cadkey*, displayed and printed.

The files were read into Carberry's *CADLeaf* software without a reported error. The images displayed without a problem.

The files were read using IDA's *IGESView* and *IGESView for Windows*. No problems were noted during this procedure. The images were printed.

The IGES files were converted using Intergraph's *I/CIGES* utility without a reported error. The resulting files were read into *I/EMS* and displayed.

The files were read using ITI's *IGESWorks* without a reported error. The files were displayed and printed.

The IGES files were converted using Rosetta Technologies' *Prepare* without a reported error. However, it was noted that the diameter symbol was displayed incorrectly on the screen and hard copy. It was displayed as a "n" instead of "Ø". The resulting files were read into Rosetta Technologies' *Preview*, displayed and printed.

Because the required Start Section statement was missing, the IGES files do not meet the CALS MIL-D-28000A Class II specification.

5. SGML Analysis

No Standard Generalized Markup Language (SGML) files were included on the tape.

6. Raster Analysis

No Raster files were included on the tape.

7. CGM Analysis

No Computer Graphics Metafile (CGM) files were included on the tape.

8. Conclusions and Recommendations

The MIL-STD-1840A tape from Lockheed Missiles & Space Compnay was correct. The tape could be read properly using the AFCTN *Tapetools* with no reported errors. The physical structure of the tape meets the CALS MIL-STD-1840A requirements.

The two IGES files do not meet the CALS MIL-D-28000A specification, because of the missing Start Section statement. The files were successfully imported into several software applications, displayed, and printed without a problem.

Because of the errors in the IGES files, the tape does not meet the CALS MIL-STD-1840A requirements.

9. Appendix A - Tapetool Report Logs

9.1 Tape Catalog

```
CALS Test Network Catalog Evaluation - Version 1.2; Release 10 (C)

  Standards referenced:
    MIL-STD-1840A (1987) - Automated Interchange of Technical Information
    ANSI X3.27 (1987) - File Structure and Labeling of Magnetic Tapes
                        for Information Interchange
    ANSI X3.4 (1986) - Coded Character Sets - 7 Bit ASCII

Thu Sep  2 09:40:52 1993

MIL-STD-1840A File Catalog

File Set Directory: /cals/u1210/Set017

Page: 1

                                                Record
                                                Format/     Block
                                                Selected/
File Name                 File Type             Length  Length/Total
Extracted
-------------------------------------------------------------------------

D001                      Document Declaration  D/00260 02048/000001
Extracted
D002                      Document Declaration  D/00260 02048/000001
Extracted
D001Q001                  IGES                  F/00080 02000/000118
Extracted
D002Q001                  IGES                  F/00080 02000/000103
Extracted

Catalog Process terminated normally.
```

9.2 Tape Evaluation Log

```
CALS Test Network Tape Evaluation - Version 1.2; Release 10 (C)
  Standards referenced:
    ANSI X3.27 (1987) - File Structure and Labeling of Magnetic Tapes
                        for Information Interchange
    ANSI X3.4 (1986) - Coded Character Sets - 7 Bit ASCII

Thu Sep  2 09:40:40 1993

ANSI Tape Import Log

Allocating tape drive /dev/rmt0...

/dev/rmt0 allocated.

VOL1␣CALS01
4

  Label Identifier: VOL1
  Volume Identifier: CALS01
  Volume Accessibility:
  Owner Identifier:
  Label Standard Version: 4

HDR1D001              CALS0100010001000000 93236 00000 000000

  Label Identifier: HDR1
  File Identifier: D001
  File Set Identifier: CALS01
  File Section Number: 0001
  File Sequence Number: 0001
  Generation Number: 0000
  Generation Version Number: 00
  Creation Date:  93236
  Expiration Date:  00000
  File Accessibility:
  Block Count: 000000
  Implementation Identifier:

HDR2D0204800260                                   00

  Label Identifier: HDR2
  Recording Format: D
  Block Length: 02048
  Record Length: 00260
  Offset Length: 00
```

```
************ Tape Mark ***************

                    <<<<< PART OF LOG FILE REMOVED HERE >>>>>

************ Tape Mark ***************

############ End of Volume CALS01 ###############

############ End Of Tape File Set ###############

Deallocating /dev/rmt0...

Tape Import Process terminated normally.
```

9.3 Tape File Set Validation Log

```
CALS Test Network File Set Evaluation - Version 1.2; Release 10 (C)

  Standards referenced:
    MIL-STD-1840A (1987) - Automated Interchange of Technical Information

Thu Sept 2 09:40:52 1993

MIL-STD-1840A File Set Evaluation Log

File Set: Set017

Found file: D001
Extracting Document Declaration Header Records...
Evaluating Document Declaration Header Records...

srcsys: LMSC Austin Division, 6800 Burleson Rd., P O Box 17100, Austin TX
78760-7100
srcdocid: 3320AS1223
srcrelid: NONE
chglvl: ORIGINAL
dteisu: 19930824
dstsys: Naval Air Warfare Center - Weapons Division NAWC-35B4 China Lake Ca
93555-6001
dstdocid: 3320AS1223
dstrelid: NONE
dtetrn: 19930824
dlvacc: NONE
filcnt: Q1
ttlcls: UNCLASSIFIED
doccls: UNCLASSIFIED
doctyp: Product Data
docttl: Test IGES drawing

Found file: D001Q001
Extracting IGES Header Records...
Evaluating IGES Header Records...

srcdocid: 3320AS1223
dstdocid: 3320AS1223
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: UNCLASSIFIED
notes: NONE
```

```
Saving IGES Header File: D001Q001_HDR
Saving IGES Data File: D001Q001_IGS

Evaluating numbering scheme...
No errors were encountered during numbering scheme evaluation.
Numbering scheme evaluation complete.

Checking file count...
No errors were encountered during file count verification.
File Count verification complete.

No errors were encountered in Document D001.

Found file: D002
Extracting Document Declaration Header Records...
Evaluating Document Declaration Header Records...

srcsys: LMSC Austin Division, 6800 Burleson Rd., P O Box 17100, Austin TX
78760-7100
srcdocid: 3320AS1224
srcrelid: NONE
chglvl: ORIGINAL
dteisu: 19930824
dstsys: Naval Air Warfare Center - Weapons Division NAWC-35B4 China Lake Ca
93555-6001
dstdocid: 3320AS1224
dstrelid: NONE
dtetrn: 19930824
dlvacc: NONE
filcnt: Q1
ttlcls: UNCLASSIFIED
doccls: UNCLASSIFIED
doctyp: Product Data
docttl: Test IGES drawing

Found file: D002Q001
Extracting IGES Header Records...
Evaluating IGES Header Records...

srcdocid: 3320AS1224
dstdocid: 3320AS1224
txtfilid: NONE
figid: NONE
srcgph: NONE
doccls: UNCLASSIFIED
notes: NONE

Saving IGES Header File: D002Q001_HDR
```

Saving IGES Data File: D002Q001_ICS

Evaluating numbering scheme...
No errors were encountered during numbering scheme evaluation.
Numbering scheme evaluation complete.

Checking file count...
No errors were encountered during file count verification.
File Count verification complete.

No errors were encountered in Document D002.

No errors were encountered in this File Set.

MIL-STD-1840A File Set Evaluation Complete.

10. Appendix B - Detailed IGES Analysis

10.1 File D001Q001

10.1.1 Parser/Verifier Log

```
 ************************************
 *****  IGES PARSER/VERIFIER   *****
 *****       MARCH 1993        *****
 *****   IGES Data Analysis    *****
 *****     (708) 344-1815      *****
 ************************************

 Input file is /mnt/u1210/Set017/D001/D001Q001_IGS

 Checking conformance to CALS Class II (MIL-D-28000A 2/10/92)

 Today is September 3, 1993  8:31 AM

 ************************************
 *****    CHECK FILE SYNTAX    *****
 ************************************

    Section        Records

    Start              1
    Global             3
    Directory       1708  (    854 Entities)
    Parameter       1171
    Terminate          1

NITPICK 2489: Excess precision in real constant (0.707106781186548) for
              Mat[0][0] of D     13.
NITPICK 2489: Messages regarding excess precision suppressed.

 ************************************
 *****  SUMMARY AND STATISTICS  ****
 ************************************

 *** File and Product Name Information ***

    File name from sender     = 'bgc12230.prt'
    File creation Date.Time   = '930812.104941'
    Model change Date.Time    = '930810.162925'
    Author                    = ' '
```

```
    Department                = 'lad/bei'
    Product name from sender = 'C2IG (Cadkey, Inc.)'
    Destination product name = 'bgc12230.prt'

 *** Parameter Delimiters ***

    Delimiter  = ','
    Terminator = ';'

 *** Originating System Data ***

    System ID              = 'CADKEY/UX  v5.02  07/02/92'
    Preprocessor version   = 'C2IG/UX SUN v5.02  08/05/92'
    Specification version = 9 (IGES 5.1)
ERROR   4048: Illegal specification version for CALS Class II specified.

 *** Precision levels ***
    Integer bits =    16
    Floating point  -  Exponent =    38  Mantissa =     7
    Double precision - Exponent =   308  Mantissa =    15

 *** Global Model Data ***

    Model scale            =  1.0000E+00
    Unit flag              =  1
    Units                  =  'IN'
    Line weights           =  1
    Maximum line thickness =  1.000000E+00
    Minimum line thickness =  1.000000E+00
CAUTION 2317: Maximum line thickness equal to minimum thickness.
    Granularity            =  5.000000E-05
    Maximum coordinate     =  0.000000E+00
CAUTION 2316: Maximum intended coordinate value of 0.000000E+00 will be
              defaulted to zero.

    Drafting standard applicable to original data is not specified.

 *** Status Flag Summary ***

  Blank status: Visible                    738
                Blanked                    116

  Independence: Independent                808
                Physically Subordinate      46
                Logically Subordinate        0
                Totally Subordinate          0

  Entity use:   Geometry                   639
```

	Annotation	215
	Definition	0
	Other	0
	Logical/Positional	0
	2D parametric	0
	Construction geometry	0
	Not Specified	0
Hierarchy:	Structure DE applies	854
	Subordinate DE applies	0
	Hierarchy property applies	0
	Not Specified	0

*** Entity Occurrence Counts ***

Entity	Form	Level	Count	Type
100	0	1	8	Circular arc
100	0	19	4	
106	31	241	1	Section lines - General use, iron, brick, stone masonry
106	40	1	8	Witness line
106	40	241	8	
110	0	1	482	Line
110	0	11	9	
110	0	19	12	
110	0	256	116	
124	0	0	8	Transformation matrix
206	0	1	2	Diameter dimension
212	0	1	2	General note
212	1	1	4	General note - dual stack dimension
212	1	241	4	
212	6	1	147	General note - multiple stack/left justified
212	6	19	7	
212	6	241	4	
214	2	1	12	Leader arrow - Triangle
214	2	241	8	
216	0	1	4	Linear dimension
216	0	241	4	

ERROR 4030: CALS Class II requires that at least one drawing be defined.

*** Entity Count by Level ***

Level	Count
0	8
1	669

11	9
19	23
241	29
256	116

*** Labeling Information ***

100% of the entities are labeled.

Unlabeled 0

Label	Count	Label	Count	Label	Count
TMATRIX	8	LINE	619	GEN NOTE	168
LDR LINE	20	DIAM DIM	2	WIT LINE	16
LIN DIM	8	ARC	12	X-HATCH	1

*** Line Fonts Used in Data ***

100	102	104	106	108	110	112	114	
-	-	-	-	-	-	-	-	Undefined
12	-	-	17	-	614	-	-	Solid
-	-	-	-	-	-	-	-	Dashed
-	-	-	-	-	-	-	-	Phantom
-	-	-	-	-	5	-	-	Center-line
-	-	-	-	-	-	-	-	Dotted
-	-	-	-	-	-	-	-	User defined

116	118	120	122	124	125	126	128	
-	-	-	-	-	-	-	-	Undefined
-	-	-	-	8	-	-	-	Solid

<<<<< *PART OF LOG FILE REMOVED HERE* >>>>>

*** Line Widths Used in Data ***

Weight	Count	Width
Defaulted	854	(1.0000)

*** Colors Used in Data ***

Defaulted	8
Red	633
Green	152
White	61

```
**********************************
*****     ENTITY ANALYSIS     *****
**********************************

*** Entity type: 100

*** Entity type: 106

CAUTION 2331: Use of section lines (Form 31-38) is not recommended at D
1643.

*** Entity type: 110

 --   619 lines averaging 9.754250E-01 units --

*** Entity type: 124

8 transformation matrices, 0 non-zero translations.

*** Entity type: 206

*** Entity type: 212

      184 text strings in data file.
      Average text aspect ratio in file is 0.9174377.
      Minimum text aspect ratio in file is 0.9000000.
      Maximum text aspect ratio in file is 1.0869518.

      FONTS USED IN FILE

      FONT   COUNT   NAME

         1     176   Default ASCII Style
      1001       2   Symbol Font 1
      1002       4   Symbol Font 2
      1003       2   Drafting Font

*** Entity type: 214

      Average arrow aspect ratio in file is 3.0000001.
      Minimum arrow aspect ratio in file is 3.0000000.
      Maximum arrow aspect ratio in file is 3.0000002.

*** Entity type: 216

*** Message Summary ***
```

```
2018: 1 Problems with line weight/width display information.
4000: 1 Miscellaneous CALS messages
4011: 1 Problems in the Global section

 *** Error Summary ***

     0 fatal errors
     0 severe errors
     2 errors
     0 warnings
     3 cautions
  3679 nitpicks
     0 notes

 *** End of Analysis of /mnt/u1210/Set017/D001/D001Q001_IGS ***
```

10.1.2 Parser Log - AutoCAD R12

```
Title: IGESIN Journal (v5.1 Nov 05 1992)
================================================================================
File: C:/TMP/Q8501.xli
Date: Thu, Sep 02, 1993
Time: 13:44:06
================================================================================

EVALUATION VERSION -- NOT FOR RESALE

Translator S/N:   117-10075750
Translating from IGES file:        C:/TMP/Q8501.IGS
            to AutoCAD Drawing:    C:\TMP\Q8501.dwg

================================================================================

Options obtained from:  default settings
Curves Approximated to Tolerance of          0.01
Surfaces Approximated to Tolerance of        0.01

Text Font/Style mapping:
IGES Text font      Style Name       ACAD Font
         0                SYMBOL0        iges0
         1               STANDARD          txt
         2                  LEROY          txt
         3                 FUTURA          txt
         6                 COMP80          txt
        12                GOTHICE       gothice
        13                GOTHICI       gothici
        14                 ROMANS        romans
        17                 ROMANT        romant
        18                 ROMAND        romand
        19                    OCR           txt
      1001                SYMBOL1      iges1001
      1002                SYMBOL2      iges1002
      1003                SYMBOL3      iges1003
      2001                  KANJI       bigfont

IGES Linefont/AutoCAD Linetype mapping
IGES Line Font      AutoCAD linetype        Shape file
         0                   BYLAYER
         1                CONTINUOUS
         2                    DASHED             acad.lin
         3                   PHANTOM             acad.lin
         4                    CENTER             acad.lin
         5                       DOT             acad.lin
```

```
Parse phase

*** Warning (IAFP__LARGER_SGL_SIG) ***
C:/TMP/Q8501.IGS, line 4: IGES file has greater number of significant digits
in single precision numbers than this system.

================================================================================
Start Section:

Global Section:

Parameter Delimiter:       ,
Record Delimiter:          ;
Sending Product ID:        C2IG (Cadkey, Inc.)
File Name:                 bgc12230.prt
System ID:                 CADKEY/UX  v5.02  07/02/92
Preprocessor Version:      C2IG/UX SUN v5.02  08/05/92
Size of Integer:           16
Sgl. Precision Mag:        38
Sgl. Precision Sig:        7
Dbl. Precision Mag:        308
Dbl. Precision Sig:        15
Receiving Product ID:      bgc12230.prt
Model Space Scale:         1.000000
Unit Flag:                 1
Unit String:               IN
# of Line Weights:         1
Maximum Line Width:        1.000000
Creation Date:             08/12/93 10:49:41
Minimum Resolution:        0.000050
Maximum Coordinate:        0.000000
Author:
Organization:              lad/bei
IGES Version Number:       9
Drafting Standard:         0
Model Create/Modify Date:  08/10/93 16:29:25

Entity Summary:

 Type      Form    Description
 Count
--------------------------------------------------------------------------------

  100         0    Circular Arc
  12
  106        31    Section Entity
  1
  106        40    Witness Line
```

```
  16
  110         0    Line
  619
  124         0    Transformation Matrix
  8
  206         0    Diameter Dimension
  2
  212         0    General Note (Simple)
  2
  212         1    General Note (Dual stack)
  8
  212         6    General Note (Left justified)
  158
  214         2    Leader (Triangle)
  20
  216         0    Linear dim - undetermined form
  8
-------------------------------------------------------------------------------
Total       854
===============================================================================

Translation phase

*** Warning (ACAD_I2AMAKESTYLEERROR) ***
Error creating text style.  Most likely could not open the
shape file for a font.  Text will be forced to STANDARD.
The style attempted was named: SYMBOL3

*** Warning (ACAD_I2AMAKESTYLEERROR) ***
Error creating text style.  Most likely could not open the
shape file for a font.  Text will be forced to STANDARD.
The style attempted was named: SYMBOL1

*** Warning (ACAD_I2AMAKESTYLEERROR) ***
Error creating text style.  Most likely could not open the
shape file for a font.  Text will be forced to STANDARD.
The style attempted was named: SYMBOL2

IGES Entity Summary

 Type   Form  Description                              Count Processed Errors
====== ====== ======================================== ===== ========= ======
   100      0 Circular Arc                              12        12      0
   106     31 Section Entity                             1         1      0
   106     40 Witness Line                              16        16      0
   110      0 Line                                     619       619      0
   206      0 Diameter Dimension                         2         2      0
   212      0 General Note (Simple)                      2         2      0
```

212	1	General Note (Dual stack)	8	8	0
212	6	General Note (Left justified)	158	158	0
214	2	Leader (Triangle)	20	20	0
216	0	Linear dim - undetermined form	8	8	0
Totals			846	846	0

AutoCAD Entity Summary

Entity	Created	Errors
LINE	716	0
CIRCLE	6	0
TEXT	166	0
ARC	6	0
INSERT	8	0
POLYLINE	1	0
DIMENSION	10	0
BLOCK	9	0
Totals	922	0

Error Summary:

The following message was issued 1 time(s)
IGES file has greater number of significant digits in single precision numbers than this system.

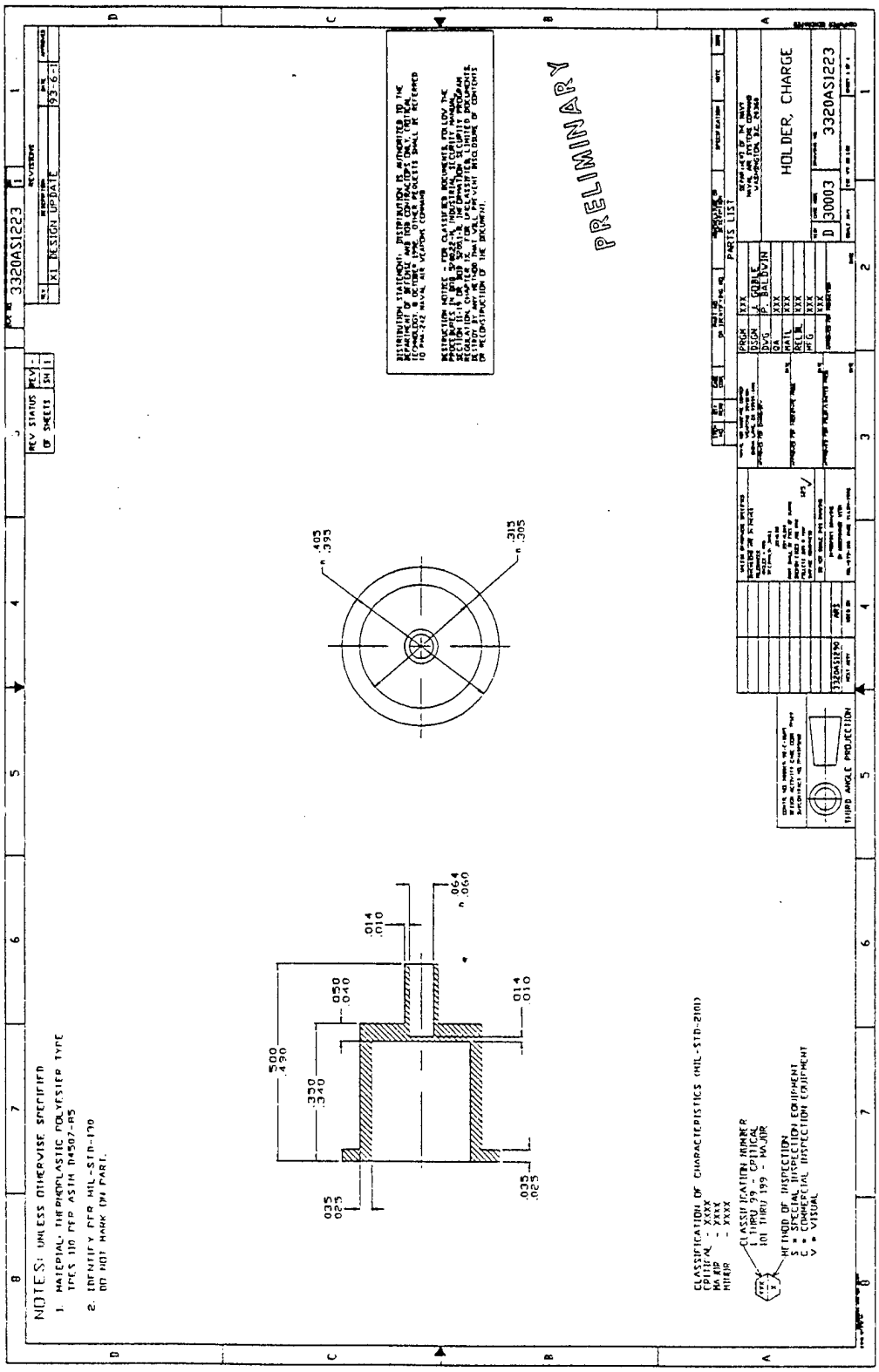
The following message was issued 8 time(s)
Error creating text style. Most likely could not open the shape file for a font. Text will be forced to STANDARD.
The style attempted was named: %s

Status: 0
Warning: 9
Error: 0
Fatal: 0

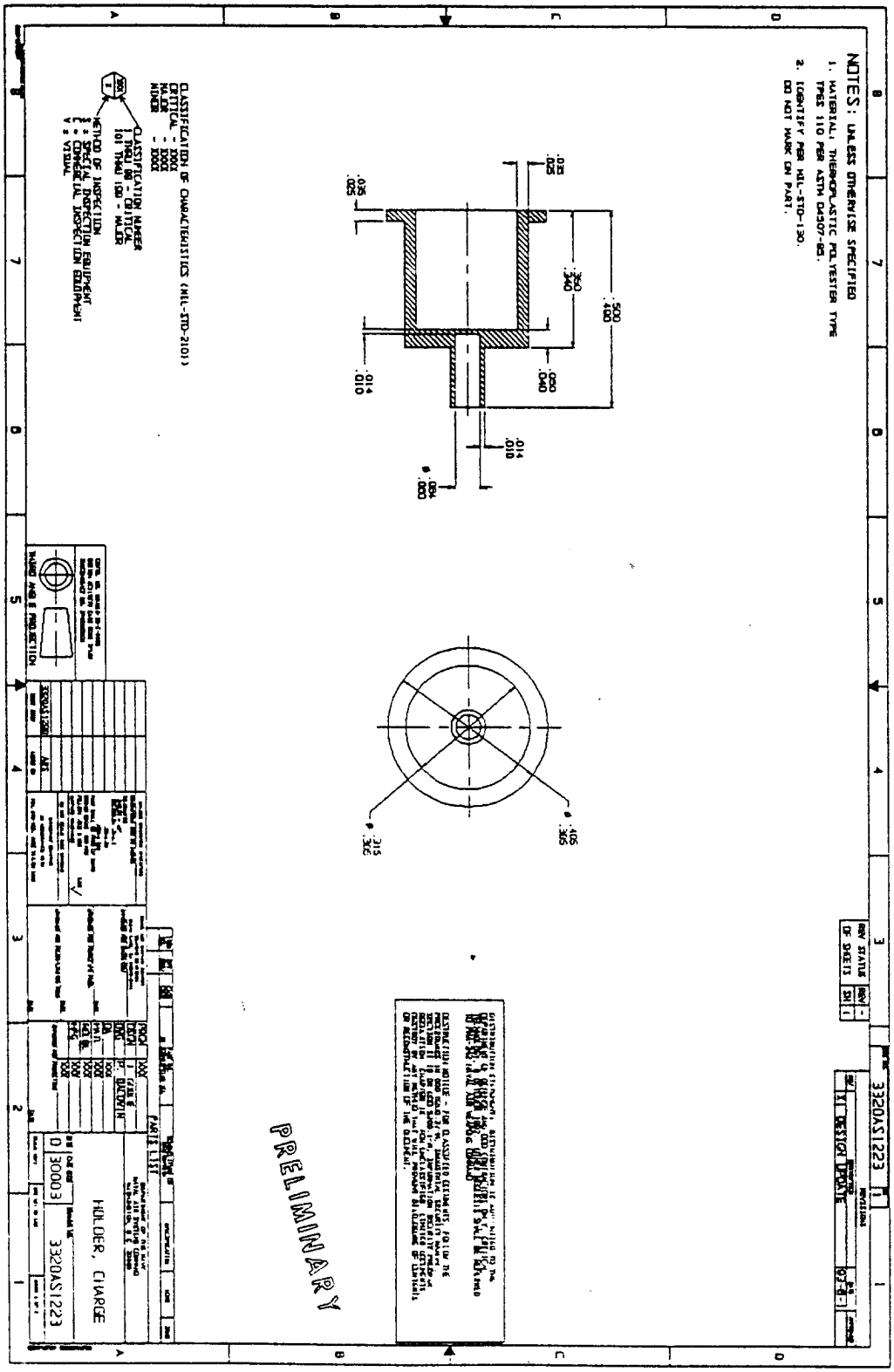
Elapsed Time:

Processor: 00:00:18
Clock: 00:00:19

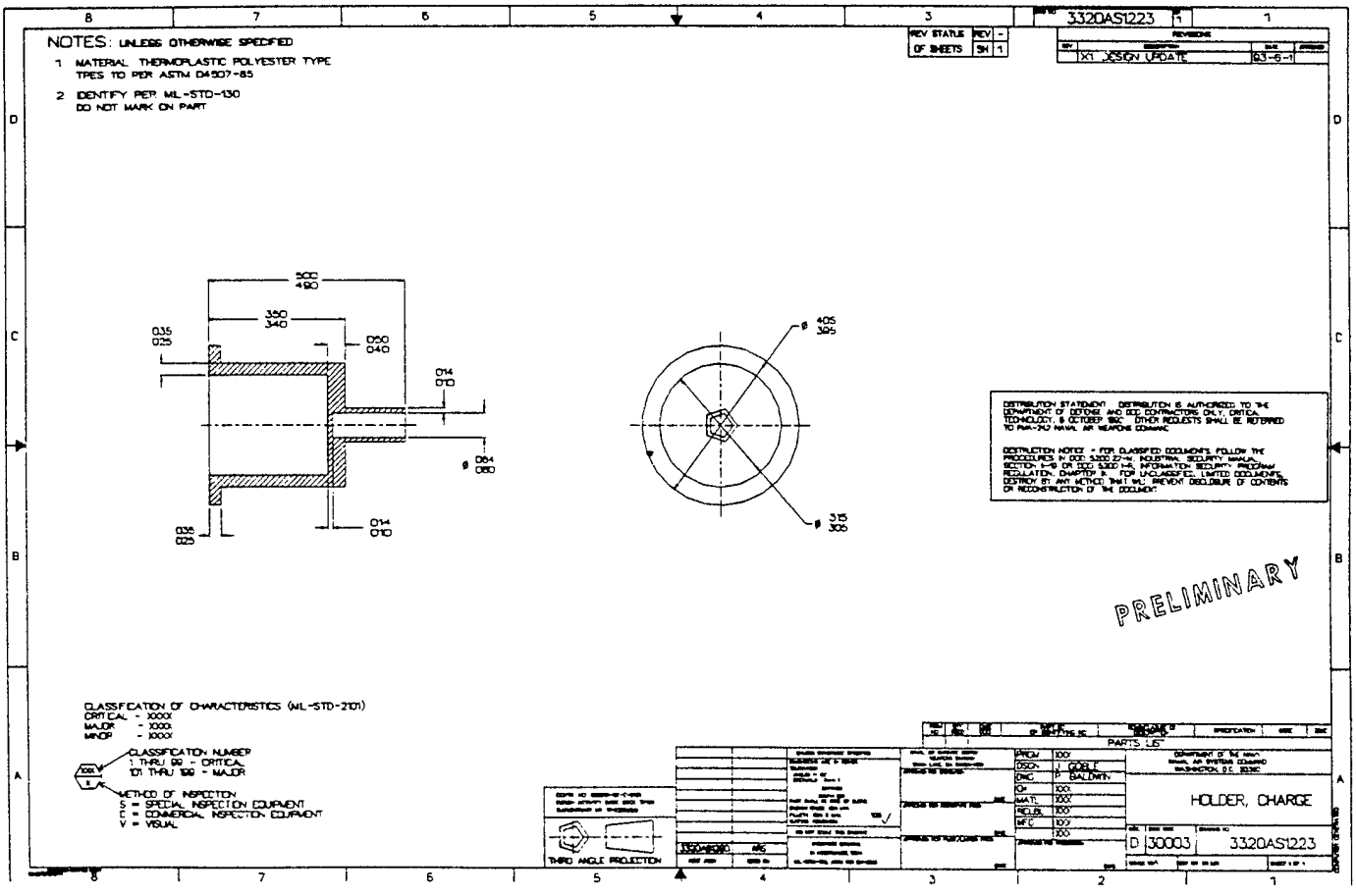
10.1.3 Output AutoCAD R12



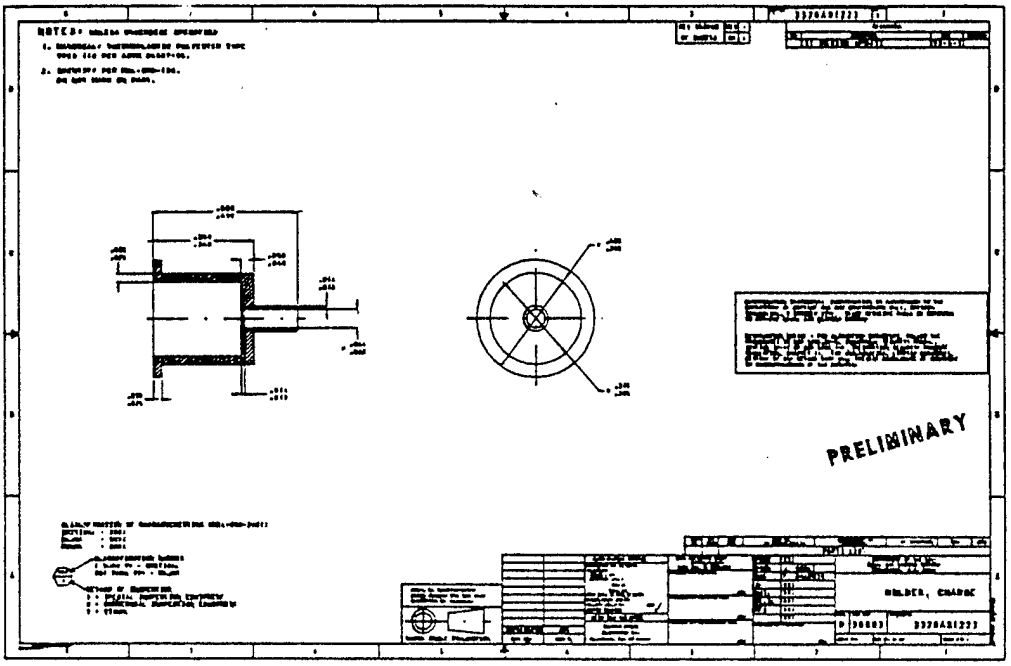
10.1.4 Output Cadkey v5.02



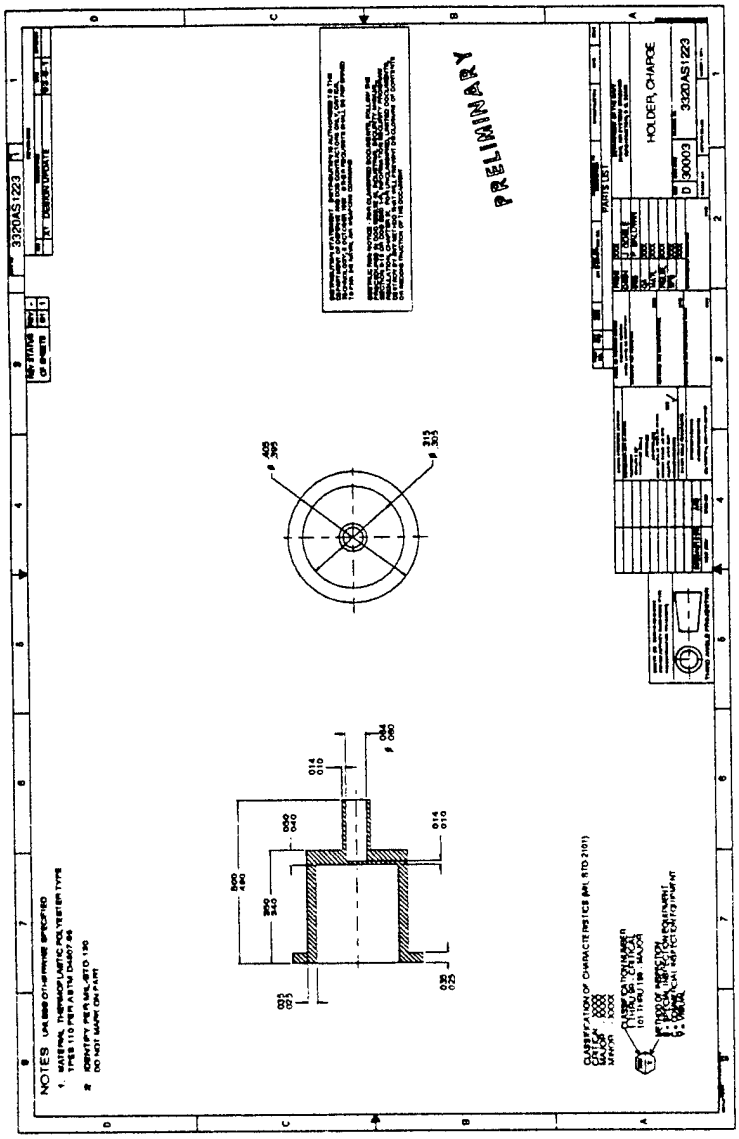
10.1.5 Output IGESView



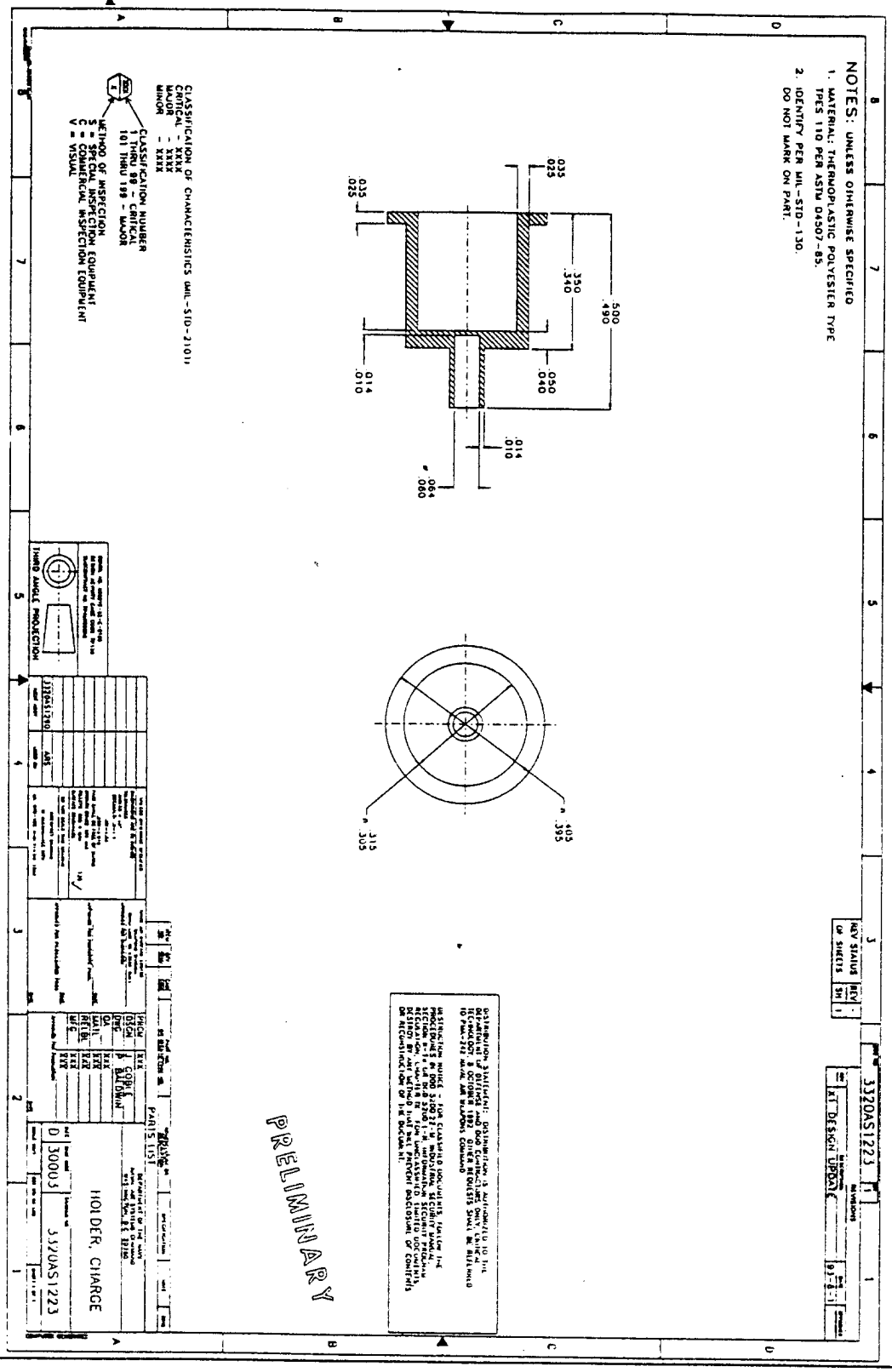
10.1.6 Output IGESWorks



10.1.7 Output iges2draw/IslandDraw



10.1.8 Output Preview



10.2 File D002Q001

10.2.1 Parser/Verifier Log

```
 ************************************
 *****  IGES PARSER/VERIFIER   *****
 *****       MARCH 1993        *****
 *****   IGES Data Analysis    *****
 *****     (708) 344-1815      *****
 ************************************

 Input file is /mnt/u1210/Set017/D002/D002Q001_IGS

 Checking conformance to CALS Class II (MIL-D-28000A 2/10/92)

 Today is September 3, 1993  8:31 AM

 ************************************
 *****    CHECK FILE SYNTAX    *****
 ************************************

    Section        Records

    Start              1
    Global             3
    Directory       1566  (    783 Entities)
    Parameter        961
    Terminate          1

NITPICK 2489: Excess precision in real constant (0.707106781186548) for
              Mat[0][0] of D     13.
NITPICK 2489: Messages regarding excess precision suppressed.

 ************************************
 *****  SUMMARY AND STATISTICS  ****
 ************************************

 *** File and Product Name Information ***

    File name from sender     = 'bgc12240.prt'
    File creation Date.Time   = '930812.105332'
    Model change Date.Time    = '930810.163041'
    Author                    = ' '
    Department                = 'lad/bei'
    Product name from sender  = 'C2IG (Cadkey, Inc.)'
    Destination product name  = 'bgc12240.prt'
```

```
 *** Parameter Delimiters ***

    Delimiter  = ','
    Terminator = ';'

 *** Originating System Data ***

    System ID              = 'CADKEY/UX  v5.02  07/02/92'
    Preprocessor version   = 'C2IG/UX SUN v5.02  08/05/92'
    Specification version = 9 (IGES 5.1)
ERROR   4048: Illegal specification version for CALS Class II specified.

 *** Precision levels ***
    Integer bits =    16
    Floating point  -  Exponent =    38  Mantissa =     7
    Double precision - Exponent =   308  Mantissa =    15

 *** Global Model Data ***

    Model scale            =  1.0000E+00
    Unit flag              =  1
    Units                  =  'IN'
    Line weights           =  1
    Maximum line thickness =  1.000000E+00
    Minimum line thickness =  1.000000E+00
CAUTION 2317: Maximum line thickness equal to minimum thickness.
    Granularity            =  5.000000E-05
    Maximum coordinate     =  0.000000E+00
CAUTION 2316: Maximum intended coordinate value of 0.000000E+00 will be
              defaulted to zero.

    Drafting standard applicable to original data is not specified.

 *** Status Flag Summary ***

  Blank status: Visible                    667
                Blanked                    116

  Independence: Independent                775
                Physically Subordinate       8
                Logically Subordinate        0
                Totally Subordinate          0

  Entity use:   Geometry                   625
                Annotation                 158
                Definition                   0
                Other                        0
```

	Logical/Positional	0
	2D parametric	0
	Construction geometry	0
	Not Specified	0
Hierarchy:	Structure DE applies	783
	Subordinate DE applies	0
	Hierarchy property applies	0
	Not Specified	0

*** Entity Occurrence Counts ***

Entity	Form	Level	Count	Type
100	0	1	8	Circular arc
100	0	11	1	
106	40	241	2	Witness line
110	0	1	486	Line
110	0	11	6	
110	0	256	116	
124	0	0	8	Transformation matrix
206	0	1	1	Diameter dimension
212	0	1	1	General note
212	1	241	1	General note - dual stack dimension
212	6	1	135	General note - multiple stack/left justified
212	6	19	9	
212	6	241	4	
214	2	1	2	Leader arrow - Triangle
214	2	241	2	
216	0	241	1	Linear dimension

ERROR 4030: CALS Class II requires that at least one drawing be defined.

*** Entity Count by Level ***

Level	Count
0	8
1	633
11	7
19	9
241	10
256	116

*** Labeling Information ***

100% of the entities are labeled.

```
   Unlabeled       0

     Label       Count       Label       Count       Label       Count

  TMATRIX          8         LINE         608    GEN NOTE         150
 LDR LINE          4     DIAM DIM           1         ARC           9
 WIT LINE          2      LIN DIM           1

*** Line Fonts Used in Data ***

100   102   104   106   108   110   112   114

 -     -     -     -     -     -     -     -    Undefined
 9     -     -     2     -    604    -     -    Solid
 -     -     -     -     -     -     -     -    Dashed
 -     -     -     -     -     -     -     -    Phantom
 -     -     -     -     -     4     -     -    Center-line
 -     -     -     -     -     -     -     -    Dotted
 -     -     -     -     -     -     -     -    User defined

116   118   120   122   124   125   126   128

 -     -     -     -     -     -     -     -    Undefined
 -     -     -     -     8     -     -     -    Solid
```

<<<<< PART OF LOG FILE REMOVED HERE >>>>>

```
*** Line Widths Used in Data ***

    Weight       Count      Width

 Defaulted       783       (1.0000)

*** Colors Used in Data ***

 Defaulted         8
       Red       627
     Green       122
     White        26

************************************
*****     ENTITY ANALYSIS     *****
************************************

*** Entity type: 100

*** Entity type: 106
```

```
 *** Entity type: 110

  --   608 lines averaging 8.090938E-01 units --

 *** Entity type: 124

8 transformation matrices, 0 non-zero translations.

 *** Entity type: 206

 *** Entity type: 212

ERROR   2279: Text box width (0.000000E+00) is negative or zero at D   1535.
ERROR   2279: Text box width (0.000000E+00) is negative or zero at D   1537.
       156 text strings in data file.
       Average text aspect ratio in file is 0.9020091.
       Minimum text aspect ratio in file is 0.0000000.
       Maximum text aspect ratio in file is 1.0869518.

       FONTS USED IN FILE

       FONT   COUNT   NAME

          1     151   Default ASCII Style
       1002       4   Symbol Font 2
       1003       1   Drafting Font

 *** Entity type: 214

       Average arrow aspect ratio in file is 3.0000001.
       Minimum arrow aspect ratio in file is 3.0000000
       Maximum arrow aspect ratio in file is 3.0000002.

 *** Entity type: 216

 *** Message Summary ***

2012: 2 Inconsistent data for entity definition.
2018: 1 Problems with line weight/width display information.
4000: 1 Miscellaneous CALS messages
4011: 1 Problems in the Global section

 *** Error Summary ***

     0 fatal errors
     0 severe errors
     4 errors
     0 warnings
```

```
    2 cautions
 2999 nitpicks
    0 notes

*** End of Analysis of /mnt/u1210/Set017/D002/D002Q001_IGS ***
```

10.2.2 Parser Log - AutoCAD R12

```
Title: IGESIN Journal (v5.1 Nov 05 1992)
================================================================================

File: C:/TMP/Q8502.xli
Date: Thu, Sep 02, 1993
Time: 13:44:30
================================================================================

EVALUATION VERSION -- NOT FOR RESALE

Translator S/N:   117-10075750
Translating from IGES file:        C:/TMP/Q8502.IGS
            to AutoCAD Drawing:    C:\TMP\Q8502.dwg

================================================================================

Options obtained from:  default settings
Curves Approximated to Tolerance of          0.01
Surfaces Approximated to Tolerance of        0.01

Text Font/Style mapping:
IGES Text font      Style Name       ACAD Font
         0                SYMBOL0        iges0
         1               STANDARD          txt
         2                  LEROY          txt
         3                FUTURA           txt
         6                COMP80           txt
        12               GOTHICE       gothice
        13               GOTHICI       gothici
        14                ROMANS        romans
        17                ROMANT        romant
        18                ROMAND        romand
        19                   OCR           txt
      1001               SYMBOL1      iges1001
      1002               SYMBOL2      iges1002
      1003               SYMBOL3      iges1003
      2001                 KANJI       bigfont
```

IGES Linefont/AutoCAD Linetype mapping

IGES Line Font	AutoCAD linetype	Shape file
0	BYLAYER	
1	CONTINUOUS	
2	DASHED	acad.lin
3	PHANTOM	acad.lin
4	CENTER	acad.lin
5	DOT	acad.lin

==========

Parse phase

*** Warning (IAFP__LARGER_SGL_SIG) ***
C:/TMP/Q8502.IGS, line 4: IGES file has greater number of significant digits in single precision numbers than this system.

*** Warning (IEVM_BAD_BOX_WIDTH_NEG_212) ***
(DE 1535, TF 212:6) Entity's substring #1 character box width is negative.

Action taken: Box width has been made positive.

*** Warning (IEVM_BAD_BOX_WIDTH_212) ***
(DE 1535, TF 212:6) Entity's substring #1 character box width equals zero.

Action taken: Box width has been changed to the default specified: 1.0000000e+000.

*** Warning (IEVM_BAD_BOX_WIDTH_NEG_212) ***
(DE 1537, TF 212:6) Entity's substring #1 character box width is negative.

Action taken: Box width has been made positive.

*** Warning (IEVM_BAD_BOX_WIDTH_212) ***
(DE 1537, TF 212:6) Entity's substring #1 character box width equals zero.

Action taken: Box width has been changed to the default specified: 1.0000000e+000.

==========

Start Section:

Global Section:

Parameter Delimiter: ,
Record Delimiter: ;
Sending Product ID: C2IG (Cadkey, Inc.)

File Name: bgc12240.prt
System ID: CADKEY/UX v5.02 07/02/92
Preprocessor Version: C2IG/UX SUN v5.02 08/05/92
Size of Integer: 16
Sgl. Precision Mag: 38
Sgl. Precision Sig: 7
Dbl. Precision Mag: 308
Dbl. Precision Sig: 15
Receiving Product ID: bgc12240.prt
Model Space Scale: 1.000000
Unit Flag: 1
Unit String: IN
# of Line Weights: 1
Maximum Line Width: 1.000000
Creation Date: 08/12/93 10:53:32
Minimum Resolution: 0.000050
Maximum Coordinate: 0.000000
Author:
Organization: lad/bei
IGES Version Number: 9
Drafting Standard: 0
Model Create/Modify Date: 08/10/93 16:30:41

Entity Summary:

Type	Form	Description	Count
100	0	Circular Arc	9
106	40	Witness Line	2
110	0	Line	608
124	0	Transformation Matrix	8
206	0	Diameter Dimension	1
212	0	General Note (Simple)	1
212	1	General Note (Dual stack)	1
212	6	General Note (Left justified)	148
214	2	Leader (Triangle)	4
216	0	Linear dim - undetermined form	1

Total 783

==========

Translation phase

*** Warning (ACAD_I2AMAKESTYLEERROR) ***
Error creating text style. Most likely could not open the
shape file for a font. Text will be forced to STANDARD.
The style attempted was named: SYMBOL3

*** Warning (ACAD_I2AMAKESTYLEERROR) ***
Error creating text style. Most likely could not open the
shape file for a font. Text will be forced to STANDARD.
The style attempted was named: SYMBOL2

IGES Entity Summary

Type	Form	Description	Count	Processed	Errors
100	0	Circular Arc	9	9	0
106	40	Witness Line	2	2	0
110	0	Line	608	608	0
206	0	Diameter Dimension	1	1	0
212	0	General Note (Simple)	1	1	0
212	1	General Note (Dual stack)	1	1	0
212	6	General Note (Left justified)	148	148	0
214	2	Leader (Triangle)	4	4	0
216	0	Linear dim - undetermined form	1	1	0
Totals			775	775	0

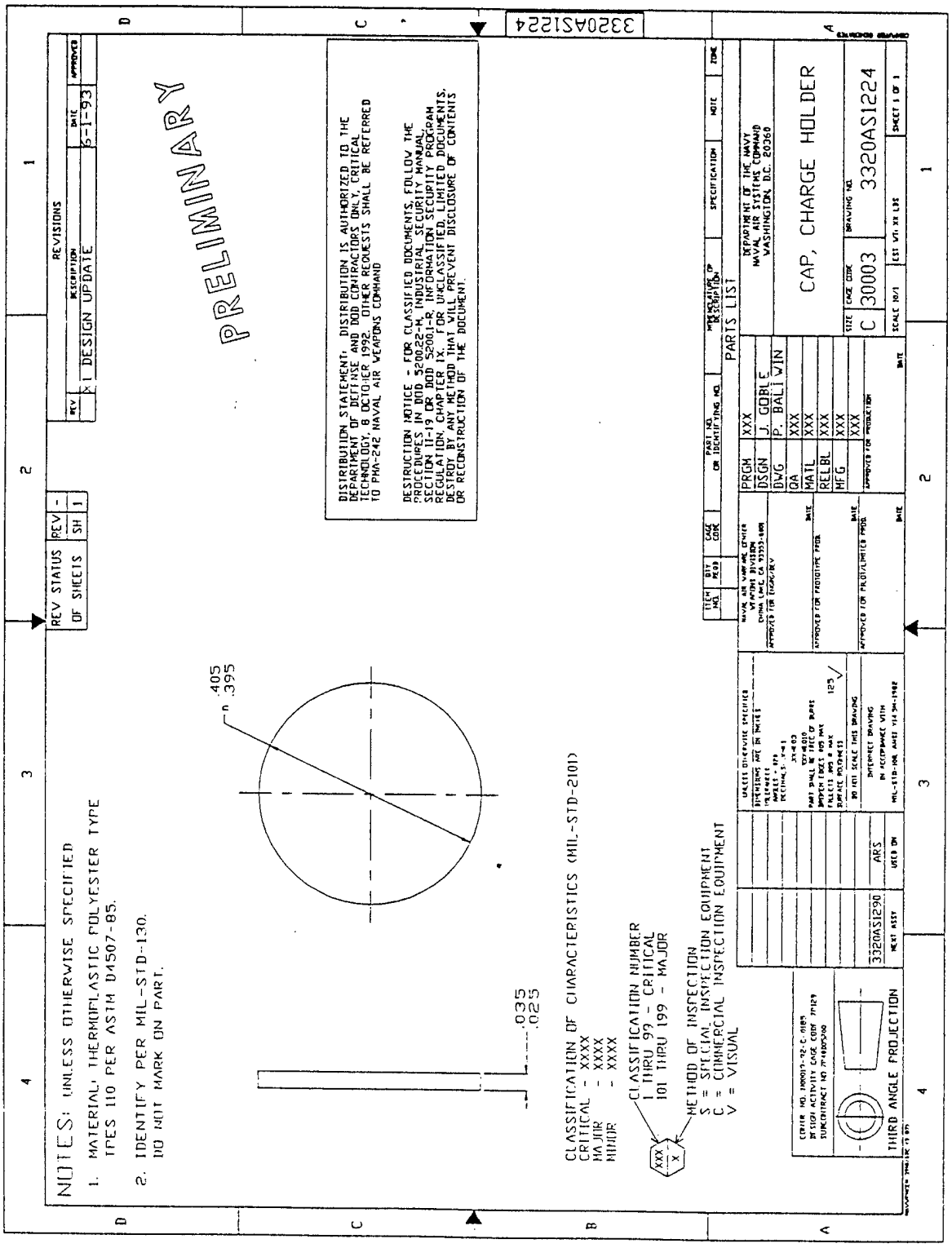
AutoCAD Entity Summary

Entity	Created	Errors
LINE	609	0
CIRCLE	3	0
TEXT	153	0
ARC	6	0
INSERT	5	0
POLYLINE	1	0
DIMENSION	2	0
BLOCK	6	0
Totals	785	0

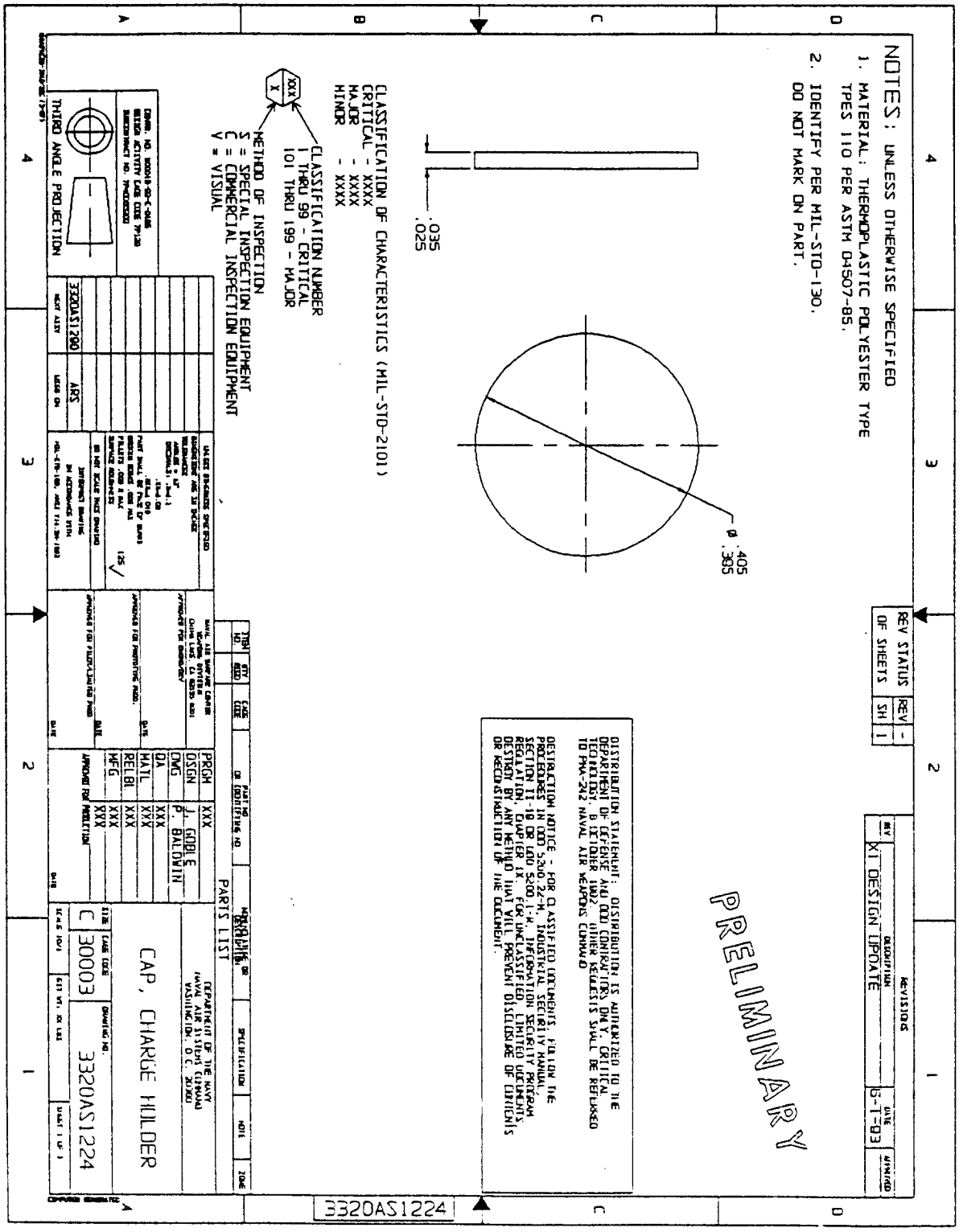
Error Summary:

```
The following message was issued 1 time(s)
IGES file has greater number of significant digits in single precision
numbers than this system.

The following message was issued 2 time(s)
Entity's substring #%d character box width equals zero.

The following message was issued 2 time(s)
Entity's substring #%d character box width is negative.

The following message was issued 5 time(s)
Error creating text style.  Most likely could not open the
shape file for a font.  Text will be forced to STANDARD.
The style attempted was named: %s

Status:  0
Warning: 10
Error:   0
Fatal:   0

Elapsed Time:

Processor: 00:00:15
Clock:     00:00:15
================================================================================
```

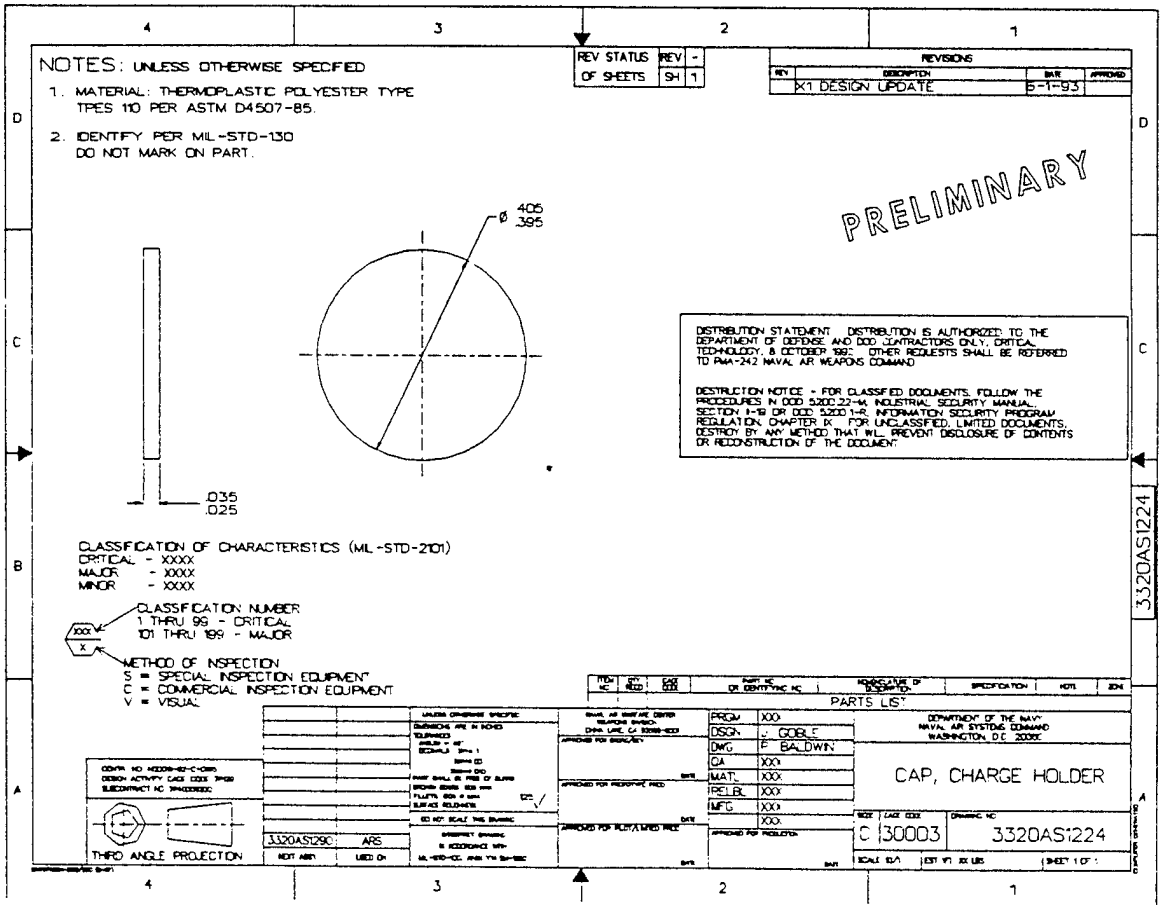
10.2.3 Output AutoCAD R12



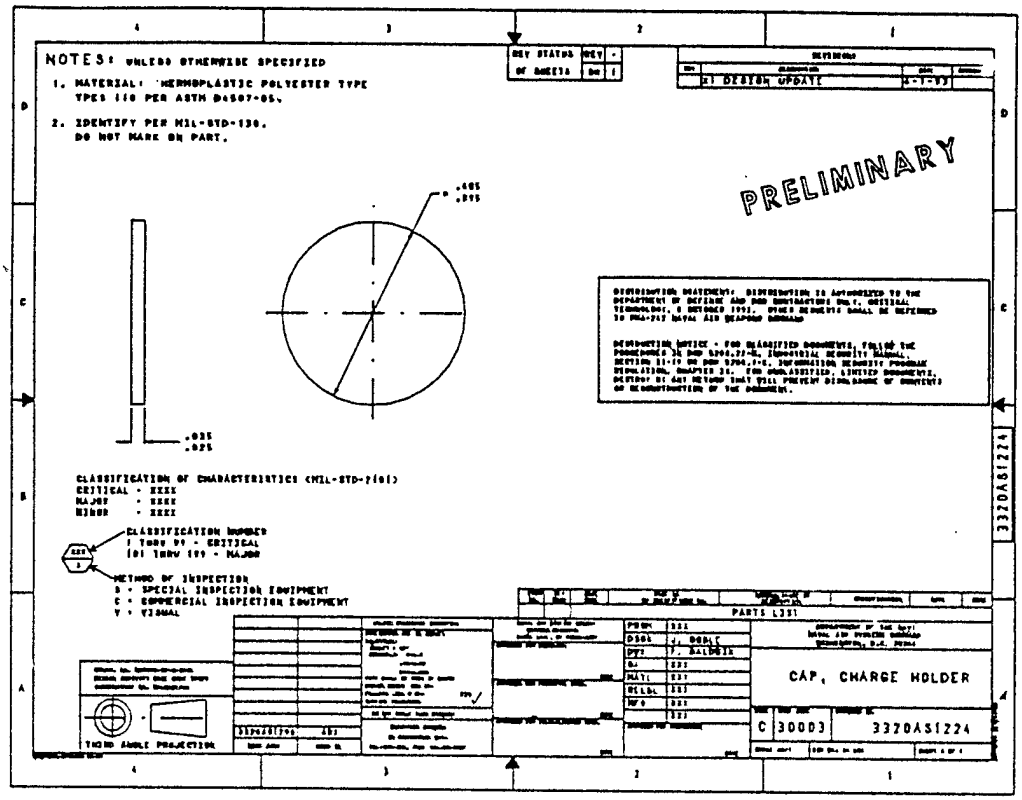
10.2.4 Output Cadkey v5.02



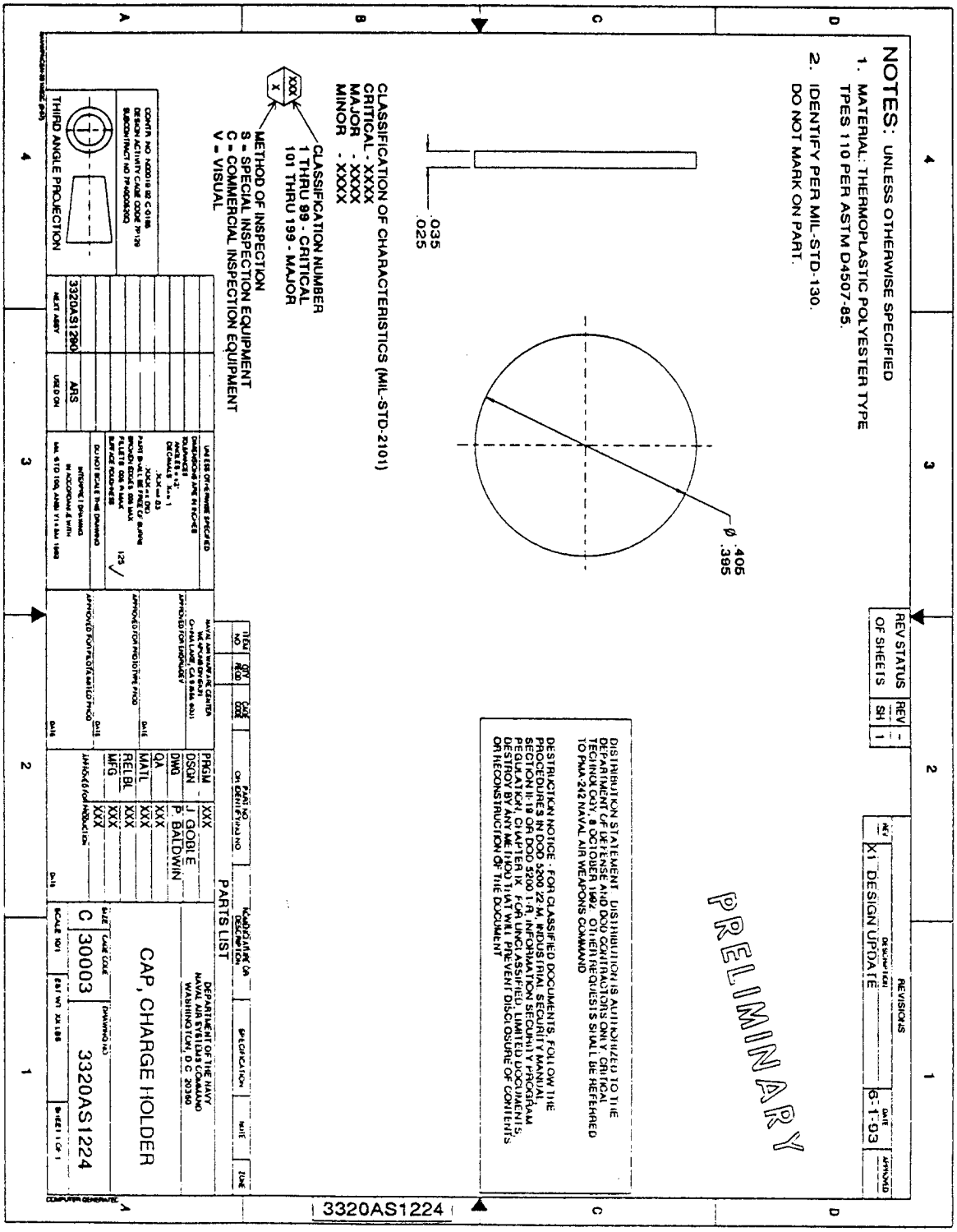
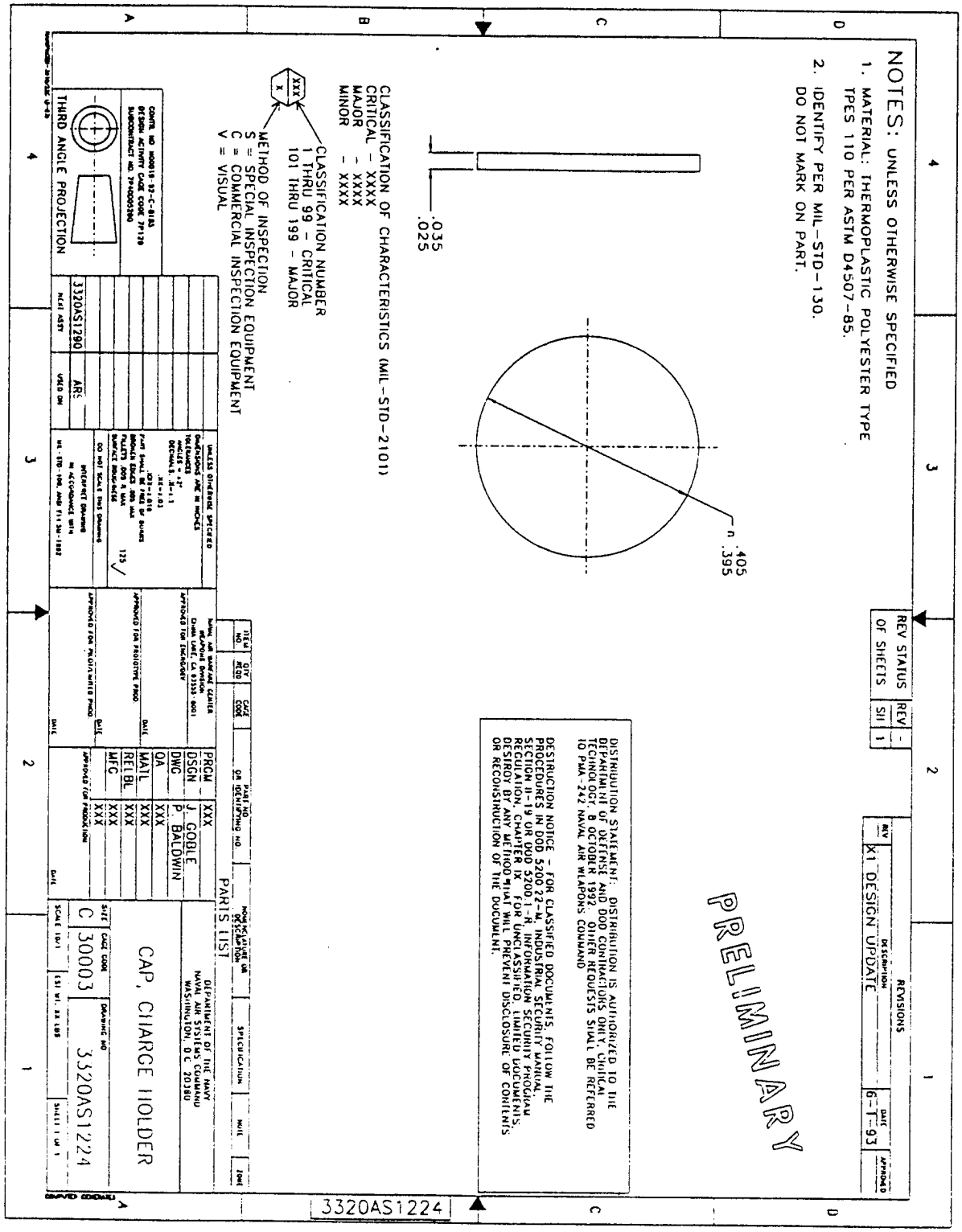
10.2.5 Output IGESView



10.2.6 Output IGESWorks



10.2.7 Output iges2draw/IslandDraw



10.2.8 Output Preview